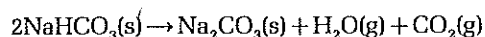
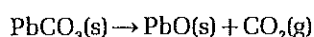


9.7 The stability of metal carbonates

Sodium carbonate does not decompose on heating. Sodium hydrogencarbonate (baking powder) does however.



Carbonates of less reactive metals also decompose on heating.



Aim

To investigate the effect of heat on metal carbonates.

Apparatus and materials

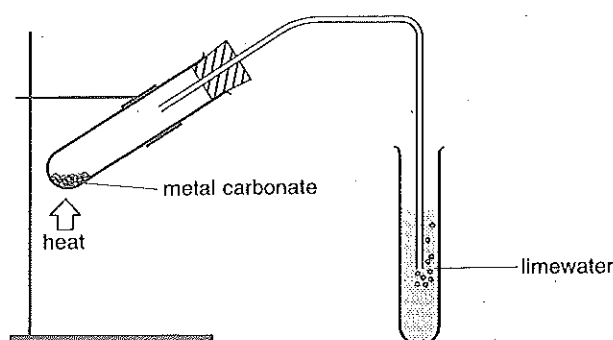
Bunsen burner and mat	Magnesium carbonate
Stand, boss and clamp	Sodium carbonate
2 test-tubes	Potassium carbonate
Bung and delivery tube	Zinc carbonate
Spatula	Calcium carbonate
Limewater	Nickel(II) carbonate
Copper(II) carbonate	

Precaution

Remove the delivery tube from the limewater immediately you stop heating the test-tube. This prevents 'sucking back'.

Procedure

- Place two spatula measures of copper(II) carbonate in a test-tube. Record its colour.
- Fit a delivery tube to the test-tube.
- Clamp the test-tube so that the delivery tube leads into another test-tube containing limewater.
- Heat the copper(II) carbonate gently. Heat more strongly if there is no change in the limewater.



- When there is no further change in the heated test-tube, remove the delivery tube from the limewater.
- Record the colour of the residue in the test-tube.
- Award a mark out of 10 for the ease of the decomposition.
- Clean out the test-tubes and repeat steps 1–7 with the other metal carbonates.

Results

Copy and complete the following table:

carbonate	colour before heating	colour after heating	marks on scale 0–10	order
copper(II) carbonate				
magnesium carbonate				
sodium carbonate				
potassium carbonate				
zinc carbonate				
calcium carbonate				
nickel(II) carbonate				

Questions

- Which carbonates do not decompose on heating? What are their positions in the reactivity series?
 - What is meant by 'sucking back'?
 - When the test-tube containing a metal carbonate is heated what is the first gas to bubble through the limewater?
 - The carbonates decompose at different temperatures. How could you modify the experiment to make a fair comparison of the ease of decomposition of the carbonates?
 - Which oxide changes colour when heated? Describe the colour change.